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PRODUCTION AND THE PUBLIC REVENUE.

Principles of Economics. Vol. ii. By Dr. N. G. Pierson. Translated from the Dutch by A A. Wotzel. Pp. xxiii+645. (London: Macmillan and Co., Ltd., 1912.) Price 10*s.* net.

THERE is much to be said both or and against the method adopted by the late Dr. Pierson of treating Value in Exchange and Money first, and dealing afterwards with Production and Public Revenue in the volume before us. Certainly some of the treatment has been narrowed, because much that rightly belongs to production has found a place in the earlier chapters, but the author has dealt admirably with the remaining phases of the subject.

His opening chapter reminds us that to define production in an economic sense is far from easy. He holds that such production is confined to material goods, either taking the form of increasing them in quantity, or bringing them into a condition to afford greater utility. He refuses to admit any production of immaterial utilities within his definition, thus taking too little account of "productive powers." J. S. Mill, it may be remembered, talked of "utilities fixed and embodied in human beings," which included those qualities that make a man industrially efficient. A truer view, therefore, would hold that production, as understood in economics, includes the creation or preservation of such powers, whether the labour consist of training producers or restoring them, when sick, to full health and vigour. The narrower definition, however, has some advantage in clearness.

Production, as thus defined, is considered in relation to Self-Interest, Population, Protection, and Land Tenure. The author was fundamentally opposed to Socialism, but no blind adherent of *laissez-faire.* Its defects are well illustrated in connection with depressions and crises and the interest of the working classes, and a strong point is made of those influences which act ultimately and mainly for good, but only after causing serious losses to individuals. Such faults are further aggravated by a too rapid growth of population, and Dr. Pierson gives a powerful criticism of the principle of Malthus and a restatement of it in the light of modern conditions. The final chapter of this part contains an admirable historical and descriptive treatment of land tenure in different countries.

The revenue of the State is of three kinds, or four if loans may be regarded as a source of income of the same order as the others. These are, first, returns from public domains or enterprises run on business lines; secondly, fees paid for a "measurable special benefit," or service performed by the State, in cases where there is a "predominant public purpose" and profit-making is a secondary consideration; and, thirdly, taxes, or "compulsory contributions from the public funds," which do not consist of special payments for some service rendered. The latter naturally occupy most of the space, and are treated in two chapters on the pressure and regulation of taxation. It only remains to add that Mr. Wotzel's really admirable translation shows to the best advantage the many merits of the book. For whilst some of its views may or may not meet with acceptance, its force, lucidity, and suggestiveness will scarcely be called in question.

N. B. DEARLE.

CHEMICAL BOOKS AND TABLES.

(1) *Landolt-Börnstein physikalisch-chemische Tabellen.* Vierte Auflage. Herausgegeben von Dr. Richard Börnstein und Dr. Walther A. Roth. Pp. xvi+1313. (Berlin: Julius Springer, 1912.) Price 56 marks.

(2) *The Elements of Qualitative Chemical Analysis.* With special consideration of the application of the Laws of Equilibrium and of the Modern Theories of Solution. By Prof. J. Stieglitz. Parts i. and ii., Fundamental Principles and their Application. Pp. xi+312. Price 1.40 dollars. Parts iii. and iv., Laboratory Manual. Pp. viii+151. Price 1.20 dollars. (New York: The Century Co., 1911–12.)

(3) *A College Text-Book on Quantitative Analysis.* By Prof. H. R. Moody. Pp. vi+165. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1912.) Price 5*s.* 6*d.* net.

(4) *A Laboratory Manual in Chemistry.* By Prof. W. C. Morgan and Prof. J. A. Lyman. Pp. xiii+142. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1912.) Price 1*s.* 8*d.* net.

(5) *Elementary Chemical Theory and Calculations.* By Dr. J. Knox. Pp. vii+103. (London: Gurney and Jackson, 1912.) Price 2*s.* net.

(1) THE new edition of the Landolt-Börnstein tables has been very greatly enlarged and covers nearly 500 pages more than the previous edition. Almost every section of the tables has contributed to this increase: it is therefore impossible to direct attention to all the features which are characteristic of the new edition. There is, however, a marked development in the use of graphic methods which will be very widely welcomed. Thus the equilibrium-diagrams for

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metallic alloys have been increased in number from 54 to 251, and a series of 149 equilibrium-diagrams for binary mixtures of fused salts, including many minerals, makes its appearance for the first time. The interval of eleven years which elapsed between previous editions of the tables has now been reduced to seven years only; this appears to be justified by the vast multiplication of numerical data, as illustrated, for instance, by the fact that the "Annual Tables" for 1910 cover more than 700 pages; but the issue of frequent editions, each of which renders the earlier ones obsolete, will tend to confine the tables more and more to the shelves of reference-libraries. The new edition is the first to be issued since the death of Prof. Landolt; it is, therefore, only fitting that a handsome portrait of the originator of the tables should appear as a frontispiece to the new volume.

(2) Complaint has frequently been made that qualitative analysis is liable to degenerate into an unintelligent use of specific tests. Prof. Stieglitz, in his two volumes on qualitative analysis, has removed the subject to the opposite pole by treating it from the point of view of the advanced student of physical chemistry. To the average student, this treatment would probably present considerable difficulty, unless he should be fortunate enough to attend Prof. Stieglitz's own lecture courses and hear his explanations at first hand. Under other conditions there might be some disadvantage in placing the book directly in the hands of the student; but nothing but good can accrue from the assimilation of the contents of the two volumes by teachers responsible for conducting classes in qualitative analysis; they will then be provided with authentic explanations of the more puzzling reactions, and can hand on to their students as much of the underlying theory as may be practicable or desirable. It may be noted that the author has used to some extent the novel scheme of qualitative analysis described by A. A. Noyes and Bray in the Journal of the American Chemical Society.

(3) In the "College Text-book of Quantitative Analysis" concise directions for each step of the analysis are given, with numbered references to "explanatory facts" which justify the procedure adopted. These play the part of footnotes, but are of sufficient importance to justify their appearance in full-sized type on the same page as the instructions for working. It is claimed that by this system the student is saved from the vast waste of time which results from mistakes which are made before the instructor has been able to give personal attention to each individual. By the use of these minute directions, the student at once gets into the habit of correct manipulation, accomplishes more in the same time, and, for a beginner, gets unusually good results. Although a few minor criticisms might be made, the procedure (which was tested with the help of manuscript copies of the book during five years before publication) appears to be thoroughly sound, and teachers would be well advised to examine the book and determine how far it conforms to their own requirements. The directions for gravimetric analysis are particularly good.

(4) The "Laboratory Manual" is intended to accompany the authors' "Chemistry, an Elementary Text-book." It is suggested that the book "will prove interesting to teachers who wish to present that kind of chemistry which appeals to students because of its intense human interest." This view is probably responsible for the introduction of mixtures of potassium chlorate and sugar and of cream of tartar and carbonate of soda into the earliest chapters. But it may be questioned whether any useful purpose can be served by attempting to make chemistry popular with boys by the help of fireworks; in any case, the treatment appears to be extremely scrappy and vastly inferior to courses, such as those based on the British Association syllabus, which are now coming so extensively into use in this country. In this instance, at least, any attempt to copy American methods would involve a retrograde step.

(5) In the "Elementary Chemical Theory and Calculations" numerical exercises are provided to illustrate the chief quantitative laws, of which a brief discussion is also given. There is an ample selection of examples, but many of these are somewhat widely removed from actual laboratory practice, as, for instance, where sodium is made to combine directly with bromine to give a quantitative yield of sodium bromide, or where exact numbers of grains of hydrogen are made to combine with other elements: the value of the book would have been increased greatly if more real and fewer fictitious examples had been given, and especially if use had been made of the vast array of exact analyses which have been accumulated in the course of a century's work in the determination of atomic and molecular weights. T. M. L.

BOTANICAL AND GARDENING BOOKS.

(1) *Nervation of Plants.* By F. G. Heath. Pp. vii + 187. (London: Williams & Norgate, 1912.) Price 3*s*. 6*d*. net.

(2) *Wild Flowers as They Grow.* Photographed in Colour Direct from Nature. By H. Essenhigh Corke. With descriptive text by G. Clarke Nuttall. Fourth Series. Pp. viii + 200. (London: Cassell & Co., Ltd., 1912.) Price 5*s*. net.

(3) *British Violets.* A Monograph. By Mrs. E. S. Gregory. With an introduction by

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